

AMENDMENTS TO THE SPECIFICATION

Please replace the Abstract, which is found on application page 80, with the following replacement abstract:

Provided is~~A problem of the invention is to provide a~~ vibration detecting apparatus for accurately detecting vibration transmitted to a rigid body, and particularly ~~provide a~~ toilet seat apparatus for accurately detecting body movement of a user transmitted to a toilet seat. The apparatus can include a
~~There are provided pressing device~~~~means (amplifying means)~~
~~(27)~~ for amplifying vibration by body movement of a user transmitted to an upper lid ~~(rigid body)~~ ~~(6)~~ of a toilet seat apparatus ~~(5)~~, and a piezoelectric sensor ~~(vibration detecting sensor)~~ ~~(9)~~ for detecting the amplified vibration. Therefore
~~and therefore~~, even when the toilet seat is hardly deformed by the body movement of the user transmitted to the toilet seat, the body movement of the user transmitted to the toilet seat is detected by the piezoelectric sensor ~~(vibration detecting sensor)~~ ~~(9)~~ by amplifying the body movement by the pressing ~~means~~device. Therefore ~~(amplifying means)~~ ~~(27)~~ ~~and therefore~~, the body movement of the user transmitted to the toilet seat can accurately be detected.

Please replace the paragraph that begins on application page 1, line 26, with the following replacement paragraph:

According to the toilet seat apparatus 800, as shown by the drawing, when the human body is seated, by body movement of the human body, a piezoelectric sensor 820 in a cord-like shape which is a pressure sensitive sensor included in a toilet seat 810 is deformed, and when a signal in accordance with the deformation is generated, a signal processing unit 830 processes an output signal thereof to thereby detect presence/absence[[,]] of a heart rate or the like of the human body.

Please replace the paragraph that begins on application page 2, line 9, with the following replacement paragraph:

Further, as a representative vibration detecting apparatus of a background art, there is a human body detection apparatus mounting a piezoelectric sensor at a seat as a vibration detecting sensor (refer to, for example, Patent Reference 2). FIG. 38 shows a human body detection apparatus described in Patent Reference 2, mentioned above, a piezoelectric sensor 4 is mounted below a skin 2, and urethane foam 3 in a seat 1[[,]]. Bodybody movement of the human body seated on the seat 1 vibrates the skin 2 and urethane foam 3 which are extremely highly elastic while partially deforming the skin 2 and urethane foam 3[[,]]. As~~as~~ a result, also the piezoelectric sensor can be deformed. Based on an output generated by the piezoelectric sensor in accordance with the deformation, presence/absence[[,]] of a heart rate or the like of a user is detected.

Please replace the paragraph that begins on application page 4, line 9, with the following replacement paragraph:

In order to resolve the problem of the background art, a vibration detecting apparatus of the invention is constructed by a constitution including first amplifying means for amplifying a vibration transmitted to a rigid body and a vibration detecting sensor for detecting the amplified vibration.

Please replace the paragraph that begins on application page 6, line 11, with the following replacement paragraph:

According to the constitution, the piezoelectric sensor in the cord-like shape can generate a large output and is provided with a flexibility and is difficult to be destructed even when impact continues applying thereto and outputs a detected signal for facilitating to differentiate a person and an article and therefore, detection of seating or the like can firmly be executed.

Please replace the paragraph that begins on application page 11, line 16, with the following replacement paragraph:

The upper lid 6 and the base plate 7 are integrally integrated by forming a space above the sensor 14 by fitting a screw, ~~not illustrated,~~ (not illustrated) from a through hole 16 formed at the base plate 7 to a locking portion 17 formed at the upper lid 6. Further, the piezoelectric sensor 9 is connected to the control unit 13 similar to the heater 12.

Please replace the paragraph that begins on application page 12, line 20, with the following replacement paragraph:

According to the embodiment, the piezoelectric sensor 9 in the cord-like shape is fixedly arranged on the base plate 7 by being supported by a plurality of holders 26 arranged separately from each other. As shown by FIG. 4, the pad 23 is provided with a projected portion 290 penetrating a through hole 280 formed at the base plate 7 to be able to be brought into contact with the piezoelectric sensor 9 between the holders 26 to constitute pressing means for deforming the piezoelectric sensor 9 in the cord-like shape. Further, an inner face of the upper lid ~~612~~ is fixedly arranged with the heater 12 as mentioned above.

Please replace the paragraph that begins on application page 13, line 8, with the following replacement paragraph:

However, according to the toilet seat apparatus 5, the electric signal outputted from the piezoelectric sensor 9 is masked by the control unit 13 such that vibration generated by driving a cleaning nozzle, operating a blower, or flushing water or the like in using the toilet seat apparatus 5 does not constitute a noise for detecting presence/absence[[,]] of a heart rate or the like of the human body.

Please replace the paragraph that begins on application page 23, line 17, with the following replacement paragraph:

However, the electric signal outputted from the piezoelectric sensor 9 is masked by the control unit 13 such that in using the toilet seat apparatus 5, vibration generated by driving a cleaning nozzle, operating a blower or flushing water or the like does not constitute noise for detecting

presence/absence[[,]] of a heart rate or the like of the human body.

Please replace the paragraph that begins on application page 25, line 17, with the following replacement paragraph:

Further, although according to the above-described embodiment, presence/absence[[,]] of a heart rate or the like is determined by smoothing the output signal from the piezoelectric sensor 9, there may be constructed a constitution in which the output signal of the piezoelectric sensor 9 is amplified as necessary and thereafter converted into digital data by AD conversion by a microcomputer or the like, presence/absence is determined based on a value constituted by subjecting the digital data to a moving average in the microcomputer, or a heart rate number or the like is calculated by calculating an autocorrelation coefficient of the digital data.

Please replace the paragraph that begins on application page 25, line 26, with the following replacement paragraph:

There is constructed the constitution including the pressing means (amplifying means) 27 for amplifying vibration transmitted to the upper lid (rigid body) 6, the projection (amplifying means) 28 and including the piezoelectric sensor (vibration detecting sensor) 9 for detecting amplified vibration and the vibration detection apparatus 34 is formed by the pressing means (amplifying means) 27, the projection (amplifying means) 28, and the piezoelectric sensor (vibration detecting sensor) 9.

Please replace the paragraph that begins on application page 26, line 29, with the following replacement paragraph:

Further, according to the toilet seat apparatus 5 having the vibration detecting apparatus 34, there is constructed the constitution in which the rigid bodies are the upper lid (rigid body) 6, and the base plate 7 and body movement of the user is transmitted to the toilet is detected.

Please replace the paragraph that begins on application page 27, line 6, with the following replacement paragraph:

Further, according to the toilet seat apparatus 5, there is constructed the constitution for detecting at least one of the seating, the heart beat, and the respiration from the body movement of the user.

Please replace the paragraph that begins on application page 44, line 4, with the following replacement paragraph:

Thereby, the base plate 7 of the toilet seat apparatus 5 is fixed to the toilet main body 22 at a vicinity of the pad 23 and is most difficult to be vibrated ~~the most~~ and therefore, the piezoelectric sensor (vibration detecting sensor) 9 supported by the vicinity of the pad 23 can be prevented from being vibrated at at least the supported portion. Therefore, the body movement of the user transmitted to the upper lid 6 of the toilet seat apparatus 5 in an embodiment in which the piezoelectric sensor (vibration detecting sensor) 9 per se is not vibrated can accurately be detected.

Please replace the paragraph that begins on application page 73, line 8, with the following replacement paragraph:

Further, according to the vibration detecting apparatus and the toilet seat apparatus of the invention, the vibrating rigid body is most difficult to be vibrated ~~the most~~ at a vicinity of a fixing portion and therefore, the vibration detecting sensor supported by the vicinity of the pressing portion can be prevented from being vibrated at least at the supported portion. Therefore, vibration transmitted to the rigid body can accurately be detected in an environment in which the vibration detecting sensor per se is not vibrated. Therefore, the invention achieves the effect not only in the toilet seat apparatus, the bath tub apparatus, the shower apparatus, but also to a seat having small elasticity and can be utilized also for a wheel chair. Further, the invention is applicable to a constitution with which a user is brought into contact to provide vibration other than a constitution to be seated thereon and therefore, the invention is effective also for a constitution used when the user stands thereon, a constitution used when the user stoops thereon, or a constitution used when the user lies down thereon. As an example, a weight meter, a physical length meter, a bed, a stretcher, an operation couch or the like is pointed out.